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# Real-Time Text and State Relays

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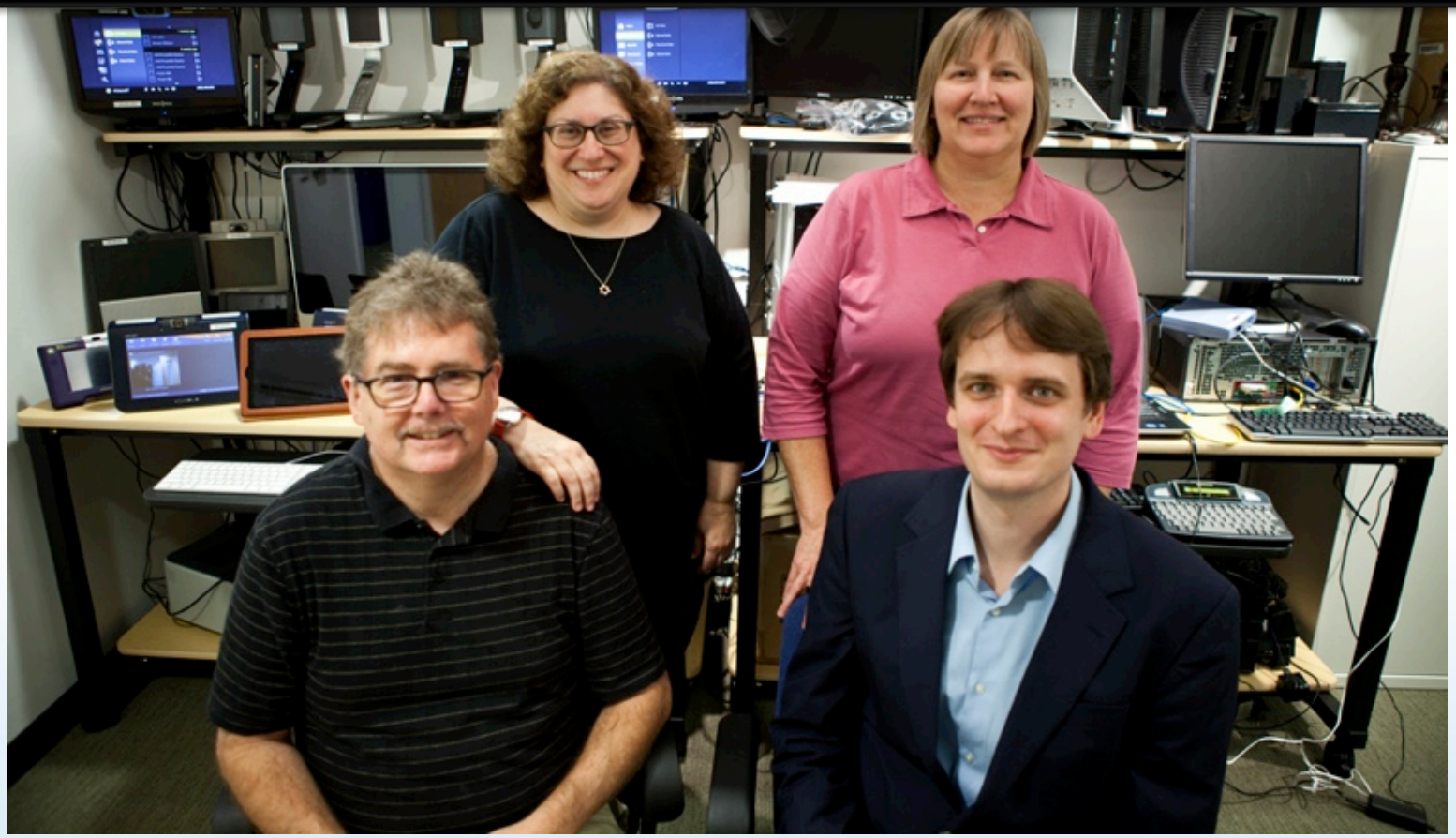
# What is TAP?

## Professional troublemakers



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# What we do

- *Deaf-led* accessible communication technology R&D for people who are deaf or hard of hearing
- Neutral and independent: We work with people from all modes of communication, and with a variety of stakeholders
  - Our mission is to make sure you can use the technology you want and need, irrespective of your preferences
- Strong ties to consumers, industry & government agencies to translate research into practice

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# Overview

- Real-time text (RTT)
  - What is it?
  - Video examples
  - What are the benefits?
  - Impacts on Relay?
  - Current Status?
- RTT and State Relays
  - TTY backward compatibility
  - Short-term needs: Integration into 7-1-1
  - Long-term needs: Beyond 7-1-1

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# What is RTT

- The ability to have text flow and be instantly seen as it is typed
  - just as speech does
  - Frequently looks like character by character transmission, but can be also in larger chunks
  - Real-time nature, with low delays, is key
- Plus the ability to have text flow at the same time as you speak
  - Enables captioned telephony
  - Text to augment speech for hard-to-understand words or number strings

# Video examples

- High-stress emergency situation, with people responding to partial content
- Low-stress situation making a movie theater appointment that highlights better interactivity via RTT compared to message-based conversation

AD version: https://www.youtube.com/watch?v=tfmAblNvr8E

Non-AD version:
https://www.facebook.com/gallaudetu/videos/vb.62082505853/10154979015940854/?type=2&theater

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# Potential Benefits

- Can call anyone with mainstream phone:
  - Without them needing a special phone or software installed on their phone
  - Call the pizza place - and use text
  - Call our neighbors, the pool, wherever, to find our children when a tornado approaches
  - Call for help from others if 911 not available
  - Call a stranger – call a friend – call our extended family - all without them having to have a special phone
- Ditch limitations of TTY's Baudot/Turbocode

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# Impact on Relay

- Since they can potentially call anyone “without TTYs” or special text devices, we may see reduced relay service use

- Also allows use of ***double-feedback speech recognition***
  - Both the speaker and the receiver can see what the speech recognition or CTS is putting out
  - The speaker can catch and re-speak (or type) anything that the speech recognition/CTS operator gets wrong.
  - Potentially increasing automated speech recognition without human operators

# We're not there yet

- These are the long term impacts, and they are uncertain
- Both immediate and long-term needs for RTT support in relay services

- **But direct calling models are the future, and relay services must fit within an IP-based direct calling world**
  - More on that later

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# Current Status

- FCC released wireless RTT rules in 12/2016
  - RTT+voice part of same call
  - Backward compatible with TTY
  - RFC4103 safe harbor technical standard
  - Phase-in 12/2017-12/2019 for tier-1 carriers
  - FNPRM on TRS, deafblind access, TTY sunset
- Wireline not mentioned (political compromise)
- TRS must be able to interface with wireless RTT, but plan ahead for wireline

# Impact on state relay

- Speculative, but how this could play out, and serve in consumers' best interests
- See joint RERC/Consumer filing in FCC CG Docket 16-145, GN Docket 15-178, February 22, 2017
  - https://www.fcc.gov/ecfs/filing/10223298222913

# State relays & RTT

- Short term (TTY-centric):
  - Expect calls both from/to TTYs and RTT devices
  - RTT may arrive as TTY calls with all the limitations of TTYs, through gateways converting between TTY and RTT
  - Gateways also will be used between wireless carriers and legacy 9-1-1 PSAPs that have TTYs

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# State relays & RTT

- Medium term (RTT-centric):
  - Expect calls both from/to TTYs and RTT devices
  - State relay handles RTT natively through 7-1-1
  - TTY may arrive as RTT, through gateways converting between TTY and RTT
  - Gateways also will be used between wireless carriers and legacy 9-1-1 PSAPs that have TTYs
- Benefits of having native RTT in state relay: no longer bound by TTY limitations
- Potential for unified technology with CTS (one backend, one call distribution system)

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# Beyond 7-1-1

- 7-1-1 follows a two-stage dialing model:
  - Connect to relay via dialing 7-1-1
  - Tell CA the phone number to call, CA connects call, and sits in between
- **This is limiting!!**
  - Need to dial something special to make/receive calls
  - Incompatible with web forms, automated callbacks, …
  - Not as functionally equivalent as IP-based relays
  - Onle reason we use this model is limitations of PSTN
  - IP doesn't have these limitations (3 way calls, instant transfer, etc)

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# Goal: 10-digit #

- Goal: Make and receive calls through a 10-digit number
  - IP-Relay, VRS allow this
  - However, this is still a relay-centric model, where the relay sits between the parties
  - Fundamentally assumes that for every call we know *a-priori* if a relay CA needs to be involved or not
- This won't work for RTT - recall that we expect to see increased direct calling uptake
  - Need to fit TRS in a direct-calling-centric model

# RTT use cases

*Italics (*) involves relay use*

1. Call between RTT users prepared to use text in both directions optionally combined with voice
2. Call between RTT-only user and voice user, where the voice user is prepared to use text through her RTT phone
3. *Call with RTT user of CTS or regular TRS, only prepared to use received text (e.g. captions) but requires that the user speaks (*)*
4. *Call with RTT user only prepared to send text but requires hearing the other party's voice (e.g. person with speech impairment) (*)*

# RTT use cases

*Italics (*) involves relay use*

5. Call with voice-only in the PSTN
6. Call with voice-only in the wireless RTT-capable networks
7. *Call to RTT capable phone, but with a hearing user who is unable to use text at the moment, even though they might use RTT in other situations (*)*
8. Call of RTT with TTY in the PSTN, when an RTT/TTY gateway is needed in the call; and
9. Call with 9-1-1 requiring use of RTT or a combination of RTT and voice

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# How to invoke TRS

- Many of these use cases can't be determined a-priori through the capabilities of the phones
  - 2. vs 7., for example
- Proposed solution: Conference in TRS via three-way calls
  - Similar to invoking IP-CTS at press of button
  - But possibly true 3-way calling architecture

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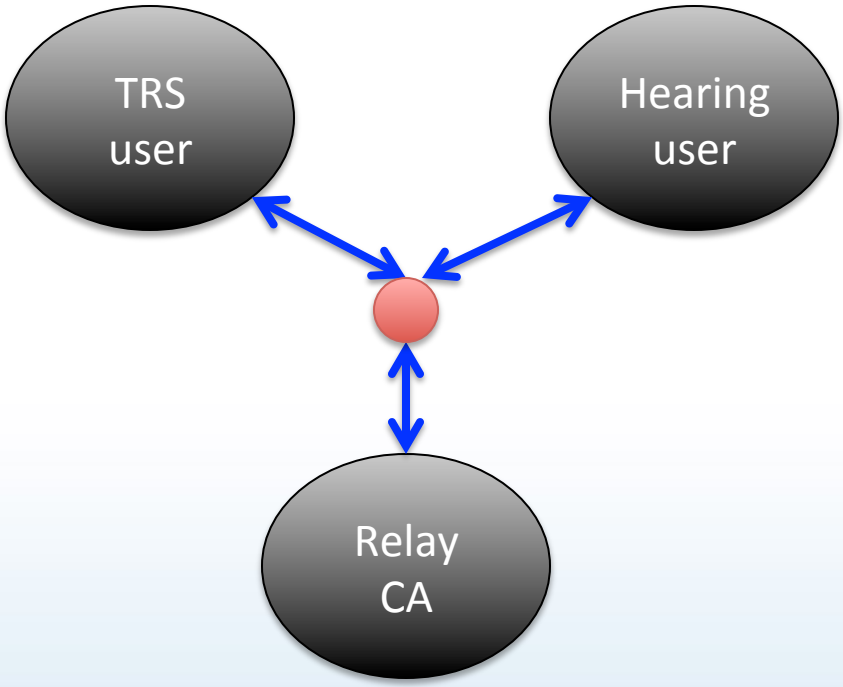
# Conferencing TRS

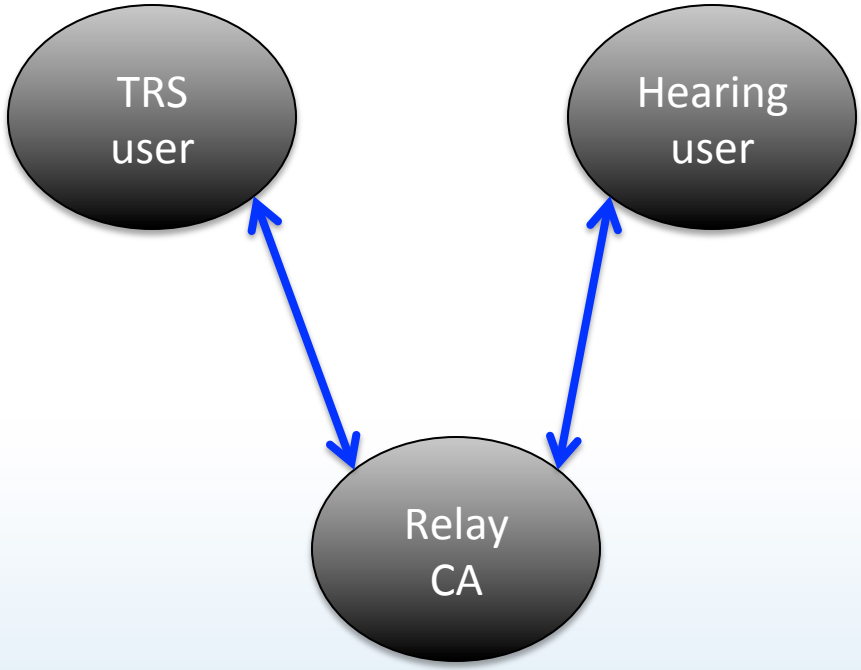
- Advantages of conferencing in TRS
  - Don’t need to know before call if you need TRS
  - Give out just one 10-digit number
  - Can add or drop TRS to/from call at will (like IP-CTS)
  - Possibility for hearing party to have access to the text communication
  - Naturally extends to conference calls with multiple TRS users
  - Modern wireless phones already 3-way-call capable

# Summary

**Consider this**




**Instead of this**



# Questions

- Questions? Comments?
- Contact us: christian.vogler@gallaudet.edu
- http://tap.gallaudet.edu/
- http://www.deafhhtech.org/

- The contents of this presentation were developed under a grant from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant number 90RE5020-02). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this presentation do not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the Federal Government.